# FORTUNA

OR

## CHANCE AND DESIGN

TO-DAY AND TO-MORROW

*For a full list of this Series see the end
of this Book*

# FORTUNA

OR

## CHANCE AND DESIGN

BY

## NORWOOD YOUNG

" The slings and arrows of outrageous fortune."—*Hamlet.*

" 'tis not so with me :
Fortune and I are friends."—*Troilus and Cressida.*

.

# FORTUNA

### OR

## CHANCE AND DESIGN

Is the universe a product of chance
or of design ?  If we suppose, by way
of hypothesis, that the earth was thrown
off by the sun, was that event acciden-
tal or inevitable ?  We may ask a
similar question with regard to the
origin of man.  Was the first step,
whatever it may have been, purely
fortuitous or was it a necessary result
of existing conditions ?  In the latter
event, were the existing conditions due
to chance or to design ?  The only
form of life which we know requires
nutrition and elimination.  Is that,

then, the one inevitable form? Or is it possible that some other scheme might have been evolved but for the occurrence of events of a fortuitous nature? Perhaps some day the human brain may have acquired the ability to deal with these problems; but, at present, we cannot supply the solutions.

Is there, indeed, any such thing as chance? Every phenomenon, however small, has had a cause, and an omniscient intelligence, acquainted with all the facts, would have foreseen every event which has ever occurred, and foresees, therefore, every event which shall occur. With complete information, all causes being known, there cannot be such a thing as chance. It is only our ignorance which creates the goddess Fortuna. What we mean by chance is the unknown, and to us unknowable, cause of an event.

In the days of the Roman Republic Fortuna was the Goddess of Fate,

one who brings destiny. Later it
was held that she was capricious in
her allotments of destiny. In the
Empire she became the goddess of
Chance. Augustus believed that For-
tuna had adopted him.

In the Middle Ages the Church
denied, as the Roman priests had
denied, the existence of Chance. But
even the orthodox have always secretly
believed that there are occult influences
at work which overcome destiny.
Fortuna has defied the hierarchy,
whether Pagan or Christian. Alone
of the Roman deities she has survived,
to please and vex mankind. The
Church has accepted Fortuna, re-
presenting her as an angel com-
missioned to promulgate God's decrees.
Dante made her the servant of God,
performing the Divine Will. She
appears, pictorially, blindfolded, like
a spiritualist medium. It is her duty
to interpret the monitions of the
ultimate Causes, which we call, in

words of paradox, the Laws of Chance.

Fortuna is represented with a wheel : sometimes she is turning it ; she may be standing on it, or on a ball. The wheel is supposed to revolve for ever ; men are seated on the rim, going up on one side, coming down on the other. The roulette wheel, it may be remarked, is seldom allowed to stop.

Fortune is fickle, unlike the Stars, which follow a fixed course. When Napoleon spoke of his Star he meant his prescribed destiny ; he was thinking of Fate, not Fortune.

Although we cannot understand either chance or design, we have certain fixed and strong convictions. It is in the nature of man to believe in personal luck, and also in a general law. Man is a unit in a series formed of units, one of the links which make the chain, an individual in a society composed of individuals. Self and company are separate and also united,

antagonists and co-operators. In their contests and their mergers we see the ego asserting itself against the aggregate, we see the gambler invoking Fortuna, whom he regards as a personal ally, against the rest of mankind.

Whenever a man exposes himself to an avoidable risk, he does so believing that he is endowed with the personal gift of luck. There are averages and probabilities which affect the mass of persons, but not the individual. He is a unique being. He forgets that all beings are unique, that each stands apart from the rest. The buyer of a lottery-ticket knows that he is only one of a large number of persons theoretically equal to himself, but he thinks he has a better chance than any other ticket-holder. However clearly he may see that he is only one of a thousand, he buys the ticket because he feels that there is something in him, which no other man has. All staking is governed

by the expectation of winning. There may be anxiety, fear, despondency, but they are overcome by a secret conviction that the staker is on terms of special intimacy with the scheme of things.

Many people have at times experienced a self-consciousness so overpowering that it seems as if they were the only realities, the only living beings in a show of wax-works. The world seems to be merely a spectacle, a vision, which will disappear when one ceases to observe it. One cannot realize that a time will come when the spectacle will still be there, without our co-operation as spectator. One cannot imagine oneself dead.

This egotism is the ultimate inspirer of all appeals to the goddess Fortuna. Few will admit that they have been fortunate in life. Most men, however successful they may have been, suppose that they have not received the rewards that are their due, that they

have merits which their fellows have not perceived. They feel that when Fortuna is appealed to, the pangs of despised worth will be exchanged for the crown of divine recognition. Every staker believes that the risk of loss which affects the mass of people is, in his own case, overborne by a special, individual, gift of luck. If he did not think that, he would not risk his money.

This natural egotism is exploited by the middlemen, who provide gaming-tables, or lay the odds at race-meetings, or buy and sell stocks on commission. The most famous medium for gambling is furnished by the Society which owns the Casino at Monte Carlo. The Society is so confident that the " laws of chance " are permanently in its favour that it publishes the results obtained, and thus provides the investigator with ample statistics for testing his conclusions. The records of play are the textbook of the

gambler. They provide the only available statistics on a large scale by which theory and fact can be compared. Buffon tossed a coin 4,000 times. Professor Karl Pearson has tossed a coin 25,000 times. Wolf, the Swiss mathematician, threw a die 280,000 times. But the Monte Carlo statistics are far greater in quantity, and they contain tabulated details which are nowhere else to be found. They provide ideal material for the practical man who distrusts abstract reasoning.

The story of Monte Carlo is a fairy tale.

In the middle of the nineteenth century the estate of Monaco, on the Riviera, brought in a very small income to its Princely owner. There was no direct road from Nizza to Monaco, or from Monaco to Mentone ; the Corniche road, busy with diligence and carriage traffic, carried travellers from Nizza up to La Turbie and thence to Genoa. Nobody thought

of coming down from La Turbie to Monaco. The coast-line of the Rivieras, French and Italian, contained a few fishing-villages surrounded by vine-yards and olive-groves. A scent-maker named Rimmel made fame and fortune by means of his violets, grown in a sheltered spot under the rock of Monaco, where now are the hotels and shops of La Condamine.

At that time the game of roulette was played at many fashionable water-ing-places on the Continent. In 1858 it was prohibited in France by the Government of Napoleon III. Monaco was under a Sardinian protectorate, unaffected by French decrees. The Prince being in chronic financial diffi-culties, the experiment was made of installing a roulette table in a building in the Piazza at Monaco. The profit derived from it, though small, was welcome.

Then, in 1860, in consequence of the assistance which France had given

in the expulsion of the Austrians from Italy, the county of Nice was ceded by Victor-Emmanuel to Napoleon III. The Sardinian troops left Monaco, which fell under the protectorate of France. The practical result of the change was to restore the effective sovereignty of the Prince.

The freedom thus obtained encouraged a larger experiment with the gambling-table. On the east side of the Monaco harbour there was a rocky promontory upon which a few pines and cactus plants contrived to exist. It was known as the *Plateau des Spélugues*. The position, with the extensive views, was suitable for the erection of a Casino. A commencement was made with a building, but the available funds became exhausted. The only coast-road was that which the French Government had made after the departure of the Sardinians, connecting Mentone with Monaco. The *Plateau des Spélugues* bore for a short

time the name *Mont Charles* in honour
of Prince Charles, the reigning Grimaldi,
but the connection with Italy then
gave it the more attractive form of
*Monte Carlo.*

With the road bringing visitors from
Italy, and a railroad in course of
construction from the French side,
there was no need to despair. A
Monsieur Blanc arrived, bringing with
him a knowledge of the gambling-
establishments in Germany. He was
so impressed by the advantage to be
derived from an exclusive concession,
practically in France, that he offered
good terms to Prince Charles, and
obtained, in 1863, a concession for
fifty years. A large, handsome Casino
was erected. The railway came from
Nice in 1868. In 1872 the German
gambling-rooms, the only serious rivals,
were closed by order of Bismarck.
Then, at last, in 1881, the difficult
coast road from Nice was completed.
The era of prosperity had begun.

# FORTUNA

The tramway line was laid in 1890.

The fables of Monte Cristo have become facts at Monte Carlo. The changes produced by Monsieur Blanc's roulette-wheel have been marvellous. The violet gardens, the vineyards and olive groves, have been replaced by hotels, and the entire coast-line of the French and Italian Rivieras has become dotted with buildings for the accommodation of visitors. Doubtless the sunny climate and beautiful scenery would in course of time have brought winter migrants, but the rapid transfiguration which has taken place has been due to the attraction of the game of roulette, of which Monte Carlo has for many years had the monopoly in western Europe.

The roulette is Fortuna's rolling wheel. It lies horizontal, with its centre on a fixed pivot. The croupier causes the wheel to revolve rapidly about its centre, and then jerks a small ivory ball in the opposite
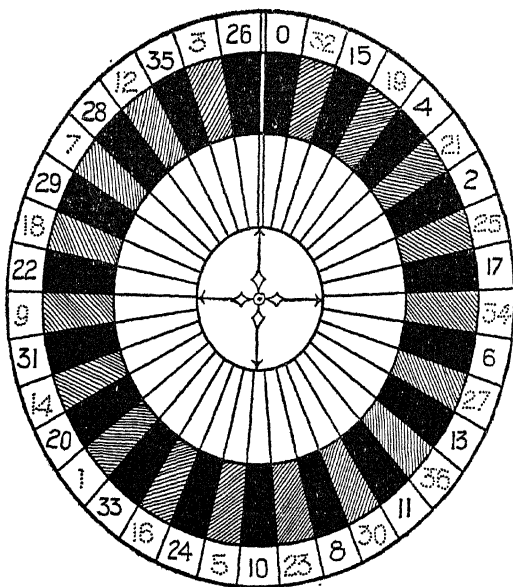
THE ROULETTE WHEEL

direction around the rim. When the ball loses its momentum, it falls into one of thirty-seven stalls cut in the circle of the wheel. These stalls are marked, in irregular order, with the numbers from zero to 36 inclusive; and they are coloured alternately red and black, except zero, which has no colour. The even chances, so-called because a successful bet upon one of them earns the value of the stake, are red against black, odd against even, first eighteen against second eighteen. Zero does not belong to any of these groups. When zero appears, the bank takes half the stakes, and thus gains, on the average, $\frac{1}{2}$ in 37, or 1.35 per cent. on the even chances. If the gambler bets on a number and wins, the bank pays him thirty-five times his stake instead of thirty-six times, and thus wins on the average one stake in thirty-seven, or 2.7 per cent. from the numbers.

Trente-et-Quarante, a game of cards,

with six packs, is also played at
Monte Carlo. There are only even
chances, red against black, and *couleur*
against *inverse*. The advantage of
the Bank, called a *refait-trente-et-un*
(when the total of each of the two
rows of cards is 31 points), amounts
to 1.28 per cent.

The staker who wishes to have a
long run for his money should confine
himself to the even chances at roulette,
or to trente-et-quarante. But the
stakes on the numbers, which entail
a loss of 2.7 per cent., far exceed in
quantity those on the even chances.
Thus the total gain of the bank cannot
be much less than 2.5 per cent.

Whatever the percentage may be,
it provides a sum sufficient to meet
the expenses of the establishment,
to pay a very substantial annuity to
the Prince, to discharge the municipal
outlay of the Principality—for there
are no direct taxes—and to give the
shareholders satisfactory dividends. The

aggregate amount staked by the public must be very large. It is swollen by the habit of restaking winnings. Seldom does any visitor confine his operations to the sum he has taken into the rooms with him, unless, indeed, he never wins at all. Thus the bank's percentage, applied over and over again, becomes considerable. If a visitor takes ten units into the rooms, it may well happen that before he has finished he has staked a hundred times. The bank's percentage has then become 27 per cent. on the numbers, which are the usual ventures.

A rough estimate, dividing the gross profits of the bank in a year by the probable number of visitors in a year, would give a loss to each visitor of at least £1. The figure may be much higher. If we suppose the bank's aggregate percentage of profit to be 2.5, it follows that for every £1 lost £40 must have been staked. The conclusion must be that each

visitor stakes, each day that he enters the rooms, an average of £40, and comes away £1 poorer than when he entered. In most cases that £1 was the whole of the money which he had about him. By restaking, the average man exposes his £1 forty times, until it is lost.

The gross profit of the bank varies from year to year, according to the number, the wealth, and the gambling proclivities of the visitors. How they stake is a matter of no concern, provided they stake often. The bank is sure to win if the stakes are numerous and varied, for it pays those who win with the money of those who lose, and takes its percentage on the total of the transactions.

Stories have been told of the anxiety which Monsieur Blanc is supposed to have felt whenever a syndicate of cool-headed men went into the Casino, to exploit a system of staking which they regarded with favour. On the

other hand he is said to have remarked, "*Rouge gagne quelquefois, noir souvent, mais blanc toujours.*" Some even of the most respectable and intelligent inventors of systems are apt to nourish the delusion that the authorities regard them with no favourable eye, and would like to suppress them, whereas, of course, no system affects the bank, save in so far as it increases the total amount staked. All systems are good for the bank because they prescribe a long course of staking and restaking.

Some believe that the croupier is capable of throwing the ball into any desired section of the wheel. To do that, he must be able to control not only the wheel but also the ball. The gentle impetus he gives to the sensitive wheel makes it continue to revolve after the ball has dropped into it, until it is stopped and re-started for the next throw. If left undisturbed, the wheel would revolve

a hundred times or more. Great
delicacy of touch has been acquired
by many manipulators of machinery,
but it has been found by experience
that a freely running roulette-wheel
is too lively and sensitive for even the
most practised hand to control. The
experiment has been made. One of
the Monte Carlo croupiers was in-
vited to turn the wheel so that it
should stop at a given point. After a
long trial it became evident that he
could not control the number of its
revolutions, still less could he make
the wheel stop at any prescribed
section of its surface.

The destiny of the ball is also
fortuitous. It revolves from five to
fifteen times, according to the energy
of the croupier. That official can
decide whether the number of revolu-
tions shall be nearer to five or to
fifteen, but it is beyond his power to
determine the exact number. More-
over, when the ball begins to descend

from the groove in which it has been circling, it comes into contact with one of the metal lozenge-shaped obstructions just below the groove. After it has received this shock, it falls on the shining metal floor of the wheel, with an impetus which makes it rebound sharply before settling into one of the stalls of the wheel, which is still revolving in the opposite direction to that of the ball. Obviously the movements of the ball are beyond control.

It has been asserted that a wheel could be constructed which could be stopped at any point, without detection. The run and stop would have to be made to depend upon the initial velocity, for any change in the rate of retardation would be observed. Probably a very delicate machine could be made which would give the desired result in an airtight, shock-free chamber. The mechanism would be so fine that it would

be disturbed by currents of air, changes of temperature, the movements of the people crowded around the table. The force of these influences is shown by the constant, though slight, swaying of the heavy electroliers which hang over the table. The delicate machinery required to control the roulette-wheel could not, in such conditions, be relied on.

The ball also would have to be projected mechanically, and that could not be done without attracting attention. But besides that consideration, which makes deception impossible, the metal lozenges and the slippery and resilient surface of the wheel introduce complications which no machine could overcome.

Every precaution is taken by the managers to keep the machinery in as perfect condition as possible, for their profits depend upon the unimpeded sway of chance. An imperfect machine would reveal pre-

ferences which would be discovered,
to the disadvantage of the bank.
The story is current that, some years
ago, a defect in one of the machines
was observed by a visitor named
Jaggers, who was a skilled mechanic.
It is said that he staked on the numbers
which he found that the machine
favoured, and thus won a large sum.
The authorities were obliged to change
the wheels from one table to another
every day. One ventures to doubt
the truth of the tale, because the
erratic movements of the ball are
independent of the wheels. If the
stalls were unequal in size the defect
would be visible.

If it was possible for a croupier to
throw the ball into any given section
of the wheel, he would do so, and
share the profits with an accomplice.
Indeed if any plan of staking were
advantageous, the croupiers, who spend
their lives at the tables, would have
found it out long ago. Amateurs

rush in where professionals fear to tread.

Thousands of systems have been invented, and sold to a gullible public. Cupidity is so strong in human nature that there are always purchasers for these wares, which are exposed in shop-windows all along the Riviera. But if a system were worth anything, the inventor would not sell it ; he would exploit it in the rooms and amass a fortune.

Let us enter the gambling-rooms. Around a large oblong table are seated twenty visitors. Two croupiers and a superintendent (*chef de partie*) have chairs on each side of the centre of the table, and one croupier sits at each end, making eight seated officials in all. Behind these twenty-eight chairs stand spectators, one or two deep, many of whom stretch over those who are seated, to place their stakes on the table. Around each table perambulates a uniformed attendant, and a

number of officials, not in uniform, wander about.

One notices the silence of all these persons, absorbed in what is going on. Stakes are pushed on the board. Some are swept away by the croupier's rake, others are left where they were placed, while the amount which has been won is pushed towards the winner. Exciting events are occurring, but in the presence of Fortuna, issuing her decrees, all are submissive and dumb.

It is a fascinating spectacle, but it may also be an unpleasant one. Among those who are actively engaged in the contest, some give evidence of strain. Even a young girl may acquire a lean and hungry look. Some faces develop a vulturous expression. Some of the players seem, as they clutch their winnings, like wild animals seizing, with grasping hands, the lump of meat pushed to them through the bars. There are large hands holding

a number of counters in an all-covering, brutally possessive, control ; and small hands, fingering and turning over the counters incessantly.

But exhibitions of disgusting greed are exceptional. Many would rather lose with dignity than exult indecently over victory. Taken purely as a game, roulette can be an entertaining diversion, with its eccentricities and surprises. For the majority of those who take part, it never degenerates from a pastime into a relentless combat.

Who would suppose that great nature's second course is sometimes taken in a chair within six feet of the rolling ball and wheel ? Snoring, and nodding, are *défendus*, but quiet slumber may be indulged in without interference. It does not seem to be considered bad manners for one of the feverish gamblers seated at the table to yawn occasionally. Doubtless, the *tricoteuses* were not able always to suppress that sign of boredom,

but is there any record of an occupant of the tumbril having yawned?

The Casino attracts visitors from every corner of the earth. Formerly it was considered necessary for an educated man to visit Paris, Rome, and Vienna. Now, Paris, London, and Monte Carlo are the essentials. Every language is spoken in the rooms. Every shade of complexion is here to be found—black, brown, yellow, red, white. Rich and poor, aristocrats and plebeians, struggle together. It is a democratic, as well as a cosmo-politan, assemblage, for all are equal in their desire for personal triumph.

The feat of "breaking the bank" is achieved when a gambler has won all the Bank's money at one of the tables. In the season thirty-one tables are in use. When one table has been cleared of its reserve of cash, more money has to be sent for; it is ready at hand in an office a few yards away, and is brought promptly. The event

occurs oftener than is generally sup-
posed. If a gambler puts the maximum
on a number, and on all its connections,
and also on the appropriate even
chances, he stands to win a large
sum when the number appears. If
such an event occurs several times
the table's money will be exhausted.
I have seen 17 appear three times in
succession when the stakes placed
upon it and its combinations, by a
single gambler, were on each occasion
the maximum. The profit was very
large and the Bank was broken.

The winner was a man controlling
large financial interests, who was
accustomed to win (and lose) larger
sums in the vicissitudes of his business.
But this breaking of the Bank at
Monte Carlo, before admiring spectators,
with the display of wealth and the
triumph against Chance, gave him
far greater pleasure than could be
obtained from a profitable transaction
in his business. It was an event which

he would remember to the end of his days.

One of the sights of Monte Carlo is the spectacle of the wholesale staker covering the board with counters, backing perhaps twenty or more numbers at the same time. The method would be as good as any other but for two objections. One is that on every single stake the operator pays, on the average, the bank's percentage, and, as he restakes his winnings, zero takes a large amount. The other objection is that he cannot remember all his fancies, and is at the mercy of any unscrupulous observer who may choose to claim as his own one of the operator's winning stakes. He is leaving his money about, tempting the weak and giving opportunity to the rascal. There are many such gentry lying in wait for just such an occasion.

Disputes inevitably occur. They are sometimes due to a genuine mistake, but, as a rule, one of the claimants

is a professional thief. The croupier has to decide. He may be obliged to send for a higher official, whose unpleasing duty it will be to deliver judgment. These officials acquire, as the result of their experience, a considerable scepticism with regard to reputations. They have learned that birth and breeding and respectability are no specific against temptation. The present writer has, for instance, himself seen the theft of a stake which was resting on the board, perpetrated by one who certainly did know better, the selected victim being a shy young girl who had not the courage to complain that her property was being stolen. Some natures become demoralized by the spectacle of rapid changes of fortune. There are people of good position who steal in shops. The temptation of the roulette-table is much greater.

It is strange what self-deceptions may be indulged in. There are

authentic instances of stakes being placed simultaneously on opposing chances, on, for instance, the first, second, and third dozens, with a unit each. Whichever dozen appears, the staker wins two units and loses two units. Except when zero takes his three units, he cannot either win or lose. He may have a long bout of staking, but the end is, of course, sure. We may be inclined to infer that he is insane, but there is another possible explanation. The pleasure of winning is such, the gratification of seeing counters pushed towards one so great, that the financial aspect of the matter may be entirely forgotten. There are people who would engage in an imaginary contest with fate, even if no money were involved and counters were provided free. Practically that is what the rich men do, and indeed what all do who confine themselves to ventures whose loss or gain are of no moment to them.

When the result is of no consequence, a win of a worthless counter may give as much pleasure as a financial success.

One is reminded of the invalid suffering from a wasting disease for whom life or death depended upon increase or decrease of bodily weight. He went to the chemist once a fortnight to be weighed. There was a loss every time. The verdict was, therefore, death. The depression he experienced was such that at last he took effectual steps. He filled his pockets with stones, and presented himself to the chemist, who duly registered an increase, and congratulated his customer, with sincerity, on the gratifying improvement he was making. The invalid emerged from the shop actually cheered by the result of the deliberate self-deception.

It is the same with those who stake on opposing chances at roulette, knowing that they cannot win but solacing

themselves with the mere appearance of winning. Most people are elated by gains and depressed by losses in a degree out of proportion to the importance of the sums involved. They are prepared to lose on balance, provided they have periods of success. And yet even success is, for many, not wholly satisfactory, leaving an unpleasant taste, as if one were obtaining advantages that were undeserved. The finder of a coin by the wayside is pleased, but he may feel a little uncomfortable, almost as if he had been guilty of theft.

Among the thousands who enter the rooms every day, a few venture sums which they cannot afford to lose. These are the only real gamblers. They are misguided people, for their gains, as well as their losses, may prove hurtful to them. Sudden changes of fortune upset the equilibrium. The winner of a large prize in a lottery may not be able to adjust himself

to the new conditions of life which the event may bring. If he has been accustomed to work steadily for a small wage, and is given wealth and leisure which he does not know how to employ to advantage, he is to be commiserated for the malicious trick that Fortuna has played upon him. Some level-headed, adaptable people may be able to adjust themselves to new conditions, but for the majority a great and sudden increase of wealth is upsetting. Without being aware of it, they will be less satisfied with their lot than they were before it underwent the violent transformation. Wealth, like alcohol, may be a useful assistant or a ferocious tyrant. Those who are unaccustomed to handle it, may, unconsciously, become slaves to habits of self-indulgence which destroy self-control.

If the gambler's equanimity is disturbed by a substantial gain, he is upset also by a severe loss. Here

again it is the moral more than the
material effect which is to be feared.
The loss of money may stimulate
to effort, it may have a therapeutical
influence, but a gambler's loss, brought
about by his own act, is a blow to
his self-esteem, a depressing event
from which there may be no moral
recovery. These are the conditions
which lead to suicide. It is not always
the monetary loss so much as the
personal defeat which drives a man
to kill himself. There would be less
inclination to do so if the financial
loss had been due to a defaulting
trustee, or to any cause for which the
victim could not blame himself. When
Fortuna is called upon, with confi-
dence, and the goddess disowns a man,
he feels an outcast : his self is crushed,
and he cannot survive the humiliation.
But such events are rare, at least
among the English visitors to Monte
Carlo, according to the best obtainable
information.

# CHANCE AND DESIGN

The visitor to the gambling-rooms will notice that many who are seated around the tables mark the result of each throw in notebooks, or on cards obligingly printed and supplied by the authorities of the Casino. If the use of these cards gave the staker any advantage, they would not be so readily provided for him, but that reflection, even when put before the note-taker, makes no impression upon him. His industry is, in fact, wasted; he believes that by noting the results that have been obtained, he may be able to foretell the results that will be obtained. This is the great illusion upon which the prosperity of Monte Carlo depends.

Among those who are unable to cast off its influence, who may be seen recording with care what they see occurring in order to deduce therefrom what will occur, are some of the ablest men of the day. It is a strange spectacle. For a moment's reflection

would enable them to perceive that in a game of chance *the past cannot affect the future*. The tosser of a coin cannot be physically disorganized by the results of his previous tossings. His capacities remain free and un-affected. To argue otherwise would be to suppose that the act of tossing a coin produces extraordinary changes in the nerves and muscles of the tosser ; an impetus given by him to the coin which would have brought it to rest head upwards no longer has that effect, owing to the inter-ference of some unknown power. Each toss must be a microbe which enters the body of the tosser, and kills all rivals. The victim becomes infectious, for if another were to pick up the coin he also would come under the influence of the anti-head germ.

Such ideas are obviously absurd. The croupier whose turning of the wheel and jerking of the ball has resulted in the ball dropping into a

red stall in the wheel cannot have become incapacitated by that event from producing the same result a second time. Nor is a second croupier, who takes his place, affected by what his predecessor has done.

This is plain and obvious, and all will admit it. And yet it is hard to find a single human being who really believes it. The literature of the subject contains two oft-repeated statements, which are antagonistic. One is that " Nothing that has happened in the past has the slightest influence on the outcome of the next succeeding spin "; the other, according to the same writer is, that after a long succession of reds "A change to black is imminent ".[1]

That each spin is separate, unaffected by what has gone before, is a fact, incontestable, certain, sure—and incredible. For it means that if red has appeared once, ten times, a hun-

[1] *The Odds at Monte Carlo.* By Scrutator (pp. 55, 116).

dred times, the next throw is as likely
to be a second red, an eleventh, or
a hundred-and-first as to be a black.

It is, frankly, difficult to believe
that the complete failure of red (or
black) to appear at the roulette-tables
at Monte Carlo for a whole year is
as likely a result as any other. Very
few indeed would be able to resist
the conclusion that such an eventuality
would be conclusive proof that the
machinery was out of order. Yet a
a run of red continued for a year is
not only possible with a perfectly
balanced machine, but its ultimate
occurrence, if the trial is prolonged,
may be confidently expected. It is
not certain, for in games of chance
there cannot be any certainty. But
we know of no cause which could
prevent a perfect machine from con-
fining itself, for a year, to red and
ignoring black altogether.

The bridge-player will accept the
principle when it is applied to bridge.

Experience has taught him not to be surprised, to the extent of incredulity, at any possible combination of cards. He is able to perceive that a hand containing 13 cards all of one suit is not more unlikely than any other combination of cards, that the probability of one hand is the same as the probability of any other. But even the bridge-player finds it well-nigh impossible to accept the same principle when applied to roulette.

The difficulty would be less if we could visualize a variegated series of results as easily as we do when we have a series which is all red or all black. A series of 1,000 reds seems to be impossible, until one reflects that no other result of 1,000 ventures is more probable. Whoever doubts that may be asked to write out any variegated series, of his own selection, which he thinks more probable than 1,000 reds. Practice enables the bridge-player to visualize a varied hand of

13 cards, but he cannot do the same with all the possible series of 13 variations of red and black.

We may illustrate this conclusion by a simple practical example. X and Y take their seats at a roulette-table at Monte Carlo before the play has begun. X remarks that the result of the day's play is as likely to be a uniform series of red as any other result. Y demurs. X suggests that Y should offer odds in favour of a series selected by himself, against X's selection of reds. Y, on hearing the matter put in that light, will doubtless decline, for he must perceive that the chance of his series is exactly equal to X's reds.

The odds against a number repeating itself four times, against for instance 1, 1, 1, 1, are 1,679,615 : 1. If such a repetition were to occur, every person present at the time would be interested, would talk about it, and remember it. A series 1, 2, 3, 4, would also be

regarded with curiosity, as a remarkable freak. Any other series, for instance the four results 25.8.12.28 with which a recent day's records began, would pass unnoticed. Yet it is obvious that the odds against 1, 1, 1, 1, against 1, 2, 3, 4 and against 25, 8, 12, 28 are the same, are in each case, 1,679,615 : 1. But the variegated series 25, 8, 12, 28, which is as unlikely as any other, seems ordinary because it makes no clear pattern to the eye.

But, while the cogency of this reasoning cannot be denied, while the principle has to be admitted, there is a stubborn refusal to accept it as a practical guide to conduct. An example may be given of what is constantly occurring.

A man went to Monte Carlo with a sum of money which he could ill afford to lose, intending to stake it at the tables on a system of his own invention. On being reminded that all systems rest on the fallacy that the

past affects the future, he replied that he was well aware of the fact. Nevertheless, he proceeded to work his system at the tables, making each venture dependent on what had gone before. This inconsistency is widely prevalent. You may hear an admission that the past does not affect the future, followed by the remark that it is advisable to watch the " run of the table ", that is, to deduce from what the table has done what it is going to do. The refusal of mankind to be convinced against its will is exhibited here in its most obstinate form.

An actual experience may be given. A convinced disbeliever in the value of the inferences as to the future that may be derived from the past, determined that he would play on a plan which would enable him to ignore the past, and would exclude all personal inclinations. He would take the first seat that he found vacant at a table ;

he would stake a unit five times in succession on the simple chance which happened to be the nearest before him ; he would then retire.

The plan proved too monotonous to be bearable. There were occasional breaks away. After two, or three, losses in succession, the temptation to double was not always resisted, the feeling that a change in the succession would occur, overcoming the mental conviction that there was no reason why it should occur. The experimenter became subject also to moments of panic, periods of abstention, when the " run of the table " seemed to be unfavourable. Sometimes, after two wins, the further stakes which the scheme prescribed until five had been made, were not prosecuted, from feelings of apprehension. On four occasions when, after a few stakes had been made, the gains and losses had cancelled each other, further contest was abandoned and the draw was

accepted. The only conditions ad-
hered to throughout were that the
stakes were always on the physically
nearest simple chance ; and that a
balance of five losses—which occurred
once—brought the session to an end.

The results, in units, were as follows.
No further details were recorded.

| | | | |
|---|---|---|---|
| November | 5 | + 3 | |
| ,, | 11 | + 4 | |
| ,, | 14 | + 2 | |
| ,, | 19 | + 2 | |
| ,, | 22 | | o |
| ,, | 25 | | o |
| | | | |
| December | 6 | + 2 | |
| ,, | 10 | | o |
| ,, | 12 | + 2 | |
| ,, | 17 | + 3 | |
| ,, | 19 | + 3 | |
| ,, | 27 | | — 1 |
| ,, | 30 | + 1 | |
| ,, | 31 | + 2 | |
| | | | |
| January | 2 | + 4 | |
| ,, | 7 | | o |
| ,, | 10 | + 3 | |
| ,, | 12 | | — 5 |
| ,, | 17 | + 3 | |
| ,, | 22 | + 2 | |

| February | 6 | + 2 |
|---|---|---|
| ,, | 11 | + 2 |
| ,, | 15 | + 2 |
| ,, | 27 | + 2 |
| March | 1 | + 2 |
| ,, | 5 | + 3 |

$$+ 49 - 6 = + 43$$

It will be seen that twenty-six sessions produced a loss on two occasions, a draw four times, and a win twenty times, with a net profit of forty-three units. On many occasions two winning stakes began and ended the session, but sometimes more than the prescribed five stakes were made. If, then, we take an average of five for each sitting, the total staked would be five, twenty-six times, or a hundred-and-thirty units. With 43 more gains than losses, there must have been $86\frac{1}{2}$ gains to $43\frac{1}{2}$ losses, instead of the average 65 wins to 65 losses. The standard deviation being

8 and the actual $21\frac{1}{2}$, the result was more than $2\frac{1}{2}$ times the standard, a remarkable though not a phenomenal result.

The series of wins were eight, four, and eight, interrupted by only two losses. The odds against such a result are very considerable. We may assume that some unfortunate person has, at some time or other, obtained losses to the same extent in the same way. If it is possible to win twenty times in twenty-two sessions (ignoring the draws), it is equally possible to lose twenty times.

The interest of the experiment lies, not in the remarkable luck of the operator, but in the emotions that swept over him. As the stake was always the minimum, the financial aspect was not of serious concern. But the operator found that not only did he fail to avoid watching what occurred, as a guide to the future, but that he could take no interest

in a fixed and monotonous method of play : he was always relieved when the ordeal for the session had come to an end. He was depressed on the two occasions of loss, and exalted on the twenty occasions of gain. Considering that the plan was devised to exclude personal choice, and that the outbreaks of self were exceptional, the effect produced by the decrees of Fortuna is noteworthy. Her smiles and her frowns were felt by the sensitive ego, even though, as a rule, no personal responsibility had been involved.

A fact of significance is that the drawn games were more pleasing than the victories. The drawn games gave evidence of a personal decision—the operator was asserting himself. There had been a duel between Fortuna and Ego, and Fortuna had been compelled to accept a verdict of equality. Her capricious tyranny had been defied. Roulette is not so much a fight for gold

[ 51 ]

as an opportunity for self-assertion.
The results are in no way affected
by the emotions aroused. Every
treatise on the game asserts the con-
trary, warning the staker that, in
the words of a recent writer: " The
only road to success is complete self-
control—in other words, the domina-
ting factor is absolute coolness."
Another author says: " The Bank
is immune from anger and despondency
and impatience and hunger and thirst
and fatigue of mind and body, to all
of which the unfortunate player is
susceptible, and all of which he must
conquer in order to stand any chance
of getting the best of that soulless,
unimpressionable Machine."

This is one of the superstitions
which are inherent in human nature.
Fortuna is supposed to reward each
one of her clients according to his
internal emotions. But if two of
them make the same bet, and one is
cool and the other excited, how can

the goddess make separate awards?
Each individual who pushes his stake
on the board believes that Fortuna
is watching his demeanour and ignor-
ing that of her other clients.

People imagine that there is a
tendency at work, which can be per-
ceived by those who keep their wits
about them. But Fortuna, like woman,
is variable and mutable ever. Her
inclination is to punish the egotists
who approach her with airs of self-
assurance, each one of them confident
that she regards him with special
favour. The indifference of Fortuna
to the interests of individuals will
never be accepted by a society com-
posed of individuals. But Nature
cares nothing for the specimen.

It is impossible to avoid being
influenced by what one sees happen-
ing. When, for instance, red or black
has appeared ten times in succession,
not one of the onlookers, not even
the most confident disbeliever, is able

to avoid a feeling that something remarkable has occurred, or to refrain from looking with keen interest to see what the eleventh throw will produce.

In actual play one cannot help using a system. Whoever stakes is affected, no matter what his intellect tells him, by what he sees going on. Insensibly and unintentionally he connects his stakes together, makes of them a series, and so uses a system. For a system is a mental connection applied to isolated events.

The gambler asserts that the events are not isolated, and he appeals to his dogma that the chances right themselves in the long run. He points out that the published results show that the law of average does work, if a large number of instances is examined. The error here is the confusion of actual with proportional results. *The longer the play is continued, the less is the proportional*

*excess, and the greater the actual excess of one colour over another.* In ten ventures it may well happen that red appears six times and black four times, an excess of two reds in ten, or twenty per cent. In 1,000 ventures the excess of one colour over the other may be 520 to 480, a surplus of 40 in 1,000, or only 1 in 250, instead of the earlier 20 in 100. The staker who lost only two stakes in ten has, by invoking the law of average, increased his loss to 40 in 1,000. It is small consolation for him to know that the longer he bets the less will be his proportionate loss, if his actual loss increases. When he has lost one stake, there is no reason to suppose that he will ever win it back, for though the colour he is expecting will ultimately appear, and will steadily increase its proportion of the total results, we have no ground for expecting it to appear oftener than the enemy colour.

We will take an example from the

published results of actual play. I turn
to a copy of *La Revue de Monte Carlo*,
of recent date, which gives the result
of 4,946 ventures. In the first ten
throws, red appeared seven times and
black three times, leaving a pre-
ponderance of four in ten, or 40 per
cent. in favour of red. The total
for the week was, red 2,355, black
2,438, giving black an excess of 83
in 4,793 throws (excluding zeros), a
percentage of 1.7. The chances have
righted themselves to the extent of
reducing the excess of one colour from
40 per cent. to 1.7 per cent., but the
backer of the wrong colour would
have lost only four units with the high
percentage against 83 with the low
percentage. Theory is confirmed by
fact.

We have still to consider the Bank's
percentage. Zero appeared 153 times.
The backer of red would have won
2,355 and lost 2,438, a loss on balance
of 83. To this has to be added a

half-stake 153 times, making a total
loss of $83 + 76\frac{1}{2} = 159\frac{1}{2}$. The backer of
black would have won 2,438 and
lost 2,355, a gain on balance of 83.
His loss to zero of $76\frac{1}{2}$ would leave
him with a profit of $6\frac{1}{2}$ points, after
staking 4,946 times. Thus the altern-
atives were to lose $159\frac{1}{2}$ or to win
$6\frac{1}{2}$. The staker was laying odds of
twenty-four to one that he would
foretell which colour would appear
oftener in 4,946 throws, obviously an
unwise wager. The righting of the
chances has enabled zero to increase
the loss of the unlucky in a sub-
stantial degree, and to reduce the
gain of the lucky to a very small
sum.

If the experiment were continued,
there would be a loss whichever colour
was selected. The next copy, in order
of date, of *La Revue de Monte Carlo*
gives the result of 4,628 throws. Red
appeared 2,292 times, black 2,218
times, and zero 118 times. Adding

these results to those of the first week, we have a total of 9,574 throws. Red appeared altogether 4,647 times, black 4,656 times, zero 271 times. A backer of red would have lost a balance of 9 stakes to black, and $135\frac{1}{2}$ to zero, making $144\frac{1}{2}$ altogether. A backer of black would have gained 9 stakes and lost $135\frac{1}{2}$, a total loss of $126\frac{1}{2}$. The chances have righted themselves to such an extent that a substantial loss is certain whichever colour is backed, because half the total appearances of zero is greater than the excess of either colour.

The mathematical probability is that in 10,000 ventures the loss to zero will be 135 and the excess of one colour over the other will be $67\frac{1}{2}$. The alternatives are a loss of 135 less $67\frac{1}{2} = -67\frac{1}{2}$ or a loss of $135 + 67\frac{1}{2} = -203\frac{1}{2}$. Experience and theory point to the same conclusion that, in 10,000 ventures on the colours, the chances will right themselves, to the advantage

of the Bank and the detriment of
the staker. With stakes on the num-
bers, where the Bank's percentage is
double that on the colours, the same
result would be produced after 5,000
ventures.

The fascinations and the mysteries
of Fortuna are such that some men
spend their lives following her vagaries
and trying to anticipate her caprices.
Systems have been invented in count-
less numbers, prescribing an increased
stake after a loss. The advocates of
' progressions ' (or ' martingales ') may
have to admit that the past does
not affect the future so far as the
appearances of red and black are
concerned, but they observe that the
pocket of the gambler is affected by
the success or failure of his past bets ;
the chance of winning may not be
increased by a previous loss, but if
the following stake is won the previous
loss is wiped out and therefore, they
say, it is legitimate to increase the

stake after a loss, whereby a win on balance may yet be obtained.

The simplest progression is the system of doubling the stake after each loss. The stakes in the event of a succession of losses would be 1, 2, 4, 8, 16, 32, etc. Each win gives a net profit of a unit. After a long adverse series, further doubling is prevented by the maximum. When that position has been reached the system has broken down.

It may be thought that theory and practice are not in agreement with regard to the occurrence of sequences of a colour, but the records show that they are in close accord. Here is a list of the sequences of one colour, from five repetitions upwards, compiled from an authentic record of 68,000 spins :

*Sequences of*

| | 5 | 6 | 7 | 8 | 9 | 10 | more than 10 |
|---|---|---|---|---|---|---|---|
| Actual: | 1002 | 534 | 279 | 152 | 84 | 30 | 32 |
| Theoretical : | 1062 | 531 | 265.5 | 132.7 | 61.3 | 30.6 | 30.6 |

It will be seen that the number of times each sequence appears is about half that of the previous sequence, which is the mathematical expectation. Theory and practice point to the same conclusion that, where a colour has appeared five or more times in succession, the probability of a repetition of the colour is the same as it was before, that is one-half.

The maximum is supposed to give the Bank an advantage, but that is neither its object nor its effect. The maximum and the minimum are designed to keep the average amount staked within prescribed limits. It would be inconvenient for the Bank if, after a number of small stakes, a large sum were placed upon the board and won. To meet such a contingency enormous reserves would have to be kept at hand. Moreover, a few huge wins might take away the whole of the profits earned over the small stakes. It is the minimum that

limits the maximum, and the minimum is prescribed to suit the desires of the public.

The maximum is no disadvantage to the gambler, for he can lose as much from a slow progression that never reaches the maximum as in any other way. If there were no maximum fixed by the Bank, and the gambler had unlimited money and a limitless life, he might be certain of winning by incessant doubling. But the necessary conditions do not exist. Nature has prescribed, for each individual, a maximum in the value and the number of his stakes, which would be just as effective as the Bank's limit.

Countless schemes have been invented to circumvent the maximum, by means of a slow progression. One of the best known, which is credited to D'Alembert, enjoins an increase of one after a loss and a decrease of one after a gain. The progression would

be 1, 2, 3 4, 5, for a series of five losses, followed by 6, 5, 4, 3, 2 for a series of five gains, which would give a net profit of $20-15=5$. After ten stakes, and as many lost as won, there is a gain of one for each two stakes. In case of intermittences the results would be $-1+2-1+2$, with a gain of one for each couple of stakes.

With this progression the maximum will never be reached, for the stakes rise slowly in case of a run of bad luck; thus a long bout of wagering may be expected, until zero has taken its toll so often that nothing is left. Even if there were no zero, the plan is worthless, because a period of success may give nothing but a succession of units, while a corresponding period of failure means that each lost stake is more expensive than the previous one. If the operator wins a series of five stakes, his gain is five, but if he loses a series of five his loss is fifteen. The

success of the system depends on frequent changes and the absence of long runs, for a favourable long run does not compensate for a subsequent unfavourable long run. Moreover, the period of failure may raise the stake to a substantial figure, which may have become as much as fifty times its original amount.

All progressions are a laying of the odds. A large sum is risked in order to win a small one. The normal course of events is that the gambler wins a small stake often, and loses the whole of his capital when an adverse run appears.

Like the rest of us, mathematicians are unable to clear themselves of the superstitions which are parasitical on human nature. They regard the very improbable as impossible, not as a hypothesis but as a terrestrial fact. Buffon said that a probability of one in ten thousand should be considered as nought. Though we have learnt

much since his day, the principle he enunciated still lives.

We will consider the opinions of three modern mathematicians of eminence.

In his *Calcul des Probabilités*, Bertrand says that in a series of 10,000 ventures, " a loss of 30 per 100, that is of 6,500 ventures, must be considered impossible."[1]

Again, " In 20,000 ventures it may be said, at roulette, that black cannot appear more than 10,500 times ; the assertion of Science is definite."

" A deviation ten times the standard gives a figure which must be regarded as a declaration of impossibility. The instrument, one must not forget, is, like the observer, supposed to be without defect."

The odds against a deviation ten times the standard are about ten

---

[1] *Calcul des Probabilités.* By J. Bertrand, (1907), pp. 15, 22, 35.

thousand millions to one. Such a result must be regarded, says the Professor, as impossible : the machine which produces it must be defective.

Professor Karl Pearson examined the results of a fortnight's play at Monte Carlo, consisting of 8,178 ventures. He found that the roulette gave one deviation ten times, and another nine times the standard deviation. He concluded that " Roulette at Monte Carlo is not a game of chance." . . . " If Monte Carlo roulette had gone on since the beginning of geological time on this earth, we should not have expected such an occurrence as this fortnight's play to have occurred *once* on the supposition that the game is one of chance."

The argument is that of Bertrand. The results were so improbable that it must be concluded that the machine which gave them was out of order.

Discussing the tossing of ten coins at once, Pearson said that if the

results were normal, we " might reasonably conclude that the ten coins with which they were made were probably pathological specimens of the race of coins."[1]

Nevertheless, so inconsistent are even the ablest among us in these matters, Professor Pearson actually spent a good portion of his vacation tossing a coin 25,000 times, and he induced his pupils to undertake other still more extended trials.   He believed that if abnormal results were obtained the coins must have been ill balanced. If that is so, his experiments could only be a test of the coins.

That is the view of Mr J. M. Keynes. He says with reference to the experiments made by Wolf in tossing dice : " This, then, is the sole conclusion of these immensely laborious experiments—that Wolf's dice were

[1] *The Chances of Death, and other Studies in Evolution* (1897), vol. i, p. 263.

very ill-made. Indeed the experiments could have had no bearing except upon the accuracy of his dice." [1]

Mr Keynes then refers to Dr Marbe's examination of 80,000 coups at Monte Carlo and elsewhere. Dr Marbe found that long runs were so much in default that it must be concluded that "the world is so constituted that long runs do not as a matter of fact occur in it. Not merely are long runs very improbable. They do not, according to him, occur at all. But we may doubt", adds Keynes, "whether roulette can tell us very much either of the laws of logic or of the constitution of the universe." And yet he has already said that the results which Wolf obtained could not occur with well-balanced dice; and that implies that the laws of chance are in conflict with the laws of physics.

The mathematician considers that

---

[1] *A Treatise on Probability* (1921), p. 363.

if a coin falls head upwards 999 times
in succession, the probability is great
that it is an ill-balanced coin which
will continue to give head at the next
toss. But if we knew that the method
of manufacture was so accurate that
a coin with an inclination for head
had never previously been produced,
the presumption would be that the
coin in question was not ill-balanced.
The extent of the possibility of an
imperfection in the coin depends on
our knowledge of the delicacy of the
machinery by which it was constructed,
not upon the results of the tossings.
No suspicion would attach to the
balance of the coin, if it were to
register a continuous series of 999
intermittences—head, tail, head, tail,
etc.—for that result would show that
the coin's ability to register head or
tail was exact. Yet a series of 999
intermittences is as improbable as a
series of 999 heads.

The assertion that a deviation from

probability ten times the standard is impossible involves an antagonism between small numbers and large numbers. If a series of a thousand heads is impossible, with a perfect coin, and there is no impossibility about ten heads, then there must be some point between ten and a thousand where the possible has become impossible. Those who accept ten heads and repudiate a thousand should be able to state exactly where the change in probability occurred.

Throughout the history of the science of probability, professors have asserted that, in games of chance, the very improbable is impossible. Even if they had been less positive, and had said merely that a machine which gives 1,000 repetitions of a colour at roulette, or of the same face when a coin is tossed, is *probably* defective, they would still be advancing an untenable proposition. For a perfect machine must give, daily and hourly, results of immense improbability.

# ˙CHANCE AND DESIGN

Consider how improbable are the results obtained at Monte Carlo, and wherever games of chance are played. Each table at Monte Carlo records, on an average, forty results per hour. The odds against every series of 40 are about a million million to one. Modern mathematicians have raised Buffon's estimate of a thousand to one as impossible. They say now that a thousand million to one is the same as impossibility. Doubtless they will, in time, decide upon a still higher number, for there are the croupiers, registering chances of a million million to one at each table every hour.

The very improbable is not impossible ; on the contrary it is the one certainty which chance can produce.

All results in any considerable quantity are in the highest degree improbable—although nothing less improbable can occur. In fact, nothing but the improbable can happen.

We will illustrate these conclusions

by considering what has actually occurred at Monte Carlo since the tables have been established there. Any estimate of the total number of coups obtained must be very hypothetical, because the number of tables in use has been much increased since the early days, and there is always a great reduction in the off-season. A calculation from the materials available enables us, however, to state a minimum. We may assert, with some confidence, that not less than 100,000,000 coups at roulette have been produced at Monte Carlo. The total may have been much greater.

What were the odds before the game began, against the series of 100,000,000 which has been experienced? They were so stupendous that one can neither state them nor imagine them. Yet this inconceivable result has actually occurred. Why then should we be surprised at such a comparative trifle as a deviation from

the standard which would need merely geological time for its occurrence? Why should we draw conclusions as to the reliability of a machine, from the examination of a few thousands or tens of thousands of examples, when we know that a perfect machine must, in time, give results so improbable that the human brain is incapable of even approaching their inconceivability?

If an event may be expected to occur once in geological time, there is no reason to suppose that it will not appear at the beginning of that period. Personal vanity makes the observer imagine that his own particular fortnight is the important one, forgetting that geological time contains a good many fortnights each of them equal to the observer's.

The results obtained with packs of cards, at trente-et-quarante, are precisely the same in character as those given by the roulette wheel and ball.

If recorded results were placed before an investigator, he would not be able to say which were obtained at roulette and which at trente-et-quarante. But the cards cannot be accused of producing impossible results owing to defects in their manufacture.

" In the roulette-wheel ", says a respectable, though misguided, writer, " there is for some inscrutable reason a more or less clearly defined limit to the occurrence in sequence of one of two or more eventualities." He suggests an " occult reason " for the non-appearance of a very long run of a colour. How is it, one is sometimes asked, that in the history of Monte Carlo neither red nor black has appeared more than 26 times in succession ? The reply is that a series of 27 mixed results of red and black, which is as likely as a series of 27 reds or a series of 27 blacks, appears at each table every time 27 throws are made ; and that results unspeak-

ably more unlikely than a colour series of 27 occur with great frequency.

A series of 26 repetitions of a colour should occur once in about 67 million throws, a series of 27 once in about 134 million throws. If the total number of throws at Monte Carlo has been, as we have supposed, 100 millions, the appearance of 26 and non-appearance of 27 is in accord with mathematical expectation.

But why this curiosity about a colour repetition? Whether there has, or has not, been a colour repetition of 26 or of 260 is a matter of no significance whatever, when we know that results enormously more improbable have actually occurred a stupendous number of times.

Those who think there is some mystery attached to the non-appearance of a colour more than 26 times may be advised to consider the insignificance of man in the face of nature. The experiences of a few

million individuals, collected around a
roulette-wheel, are so trivial that they
are unworthy of being mentioned.
It is an impertinence to trouble Fortuna
about them.

All events in the history of man are
as the links of a chain, leaning on the
past, making possible the future. No-
body will deny this : it needs only to
be stated. But the spirit of ego, the
consciousness of self, makes us dislike
the idea that we are beads on a neck-
lace. We know it must be so, but
we are unable to give the fact a hearty
welcome. It is difficult to realize our
insignificance as transient persons and
our splendour as the units which form
a permanent society—to perceive that
the turning of a wheel or tossing of a
coin is, compared with all past and all
future events of a like nature, an
event negligible in itself, but necessary
for the formation of an aggregate—
that a series of a thousand is itself
no more than a unit in a series

of a thousand series of a thousand.

The erroneous belief that the occurrence of an event makes a repetition unlikely recalls the reasoning of the boatswain, in Marryat's novel *Peter Simple*. When a shot struck the ship, that worthy rushed to the spot where it had entered the vessel's side, and put his head into the hole, arguing that it was very improbable that another shot would hit the same spot. He had, in fact, put his head in the place which was the most likely to be hit again. No other spot could be mentioned which was as probable. In this case the past does affect the future, for it is not a question of mere chance. The man who fired the shot exercised a personal influence upon the result. His aim would take effect within limits which could be defined. Of the possible directions in which the shot could be sent, the immense majority were eliminated by the directing will of the operator.

# FORTUNA

Other examples of events affected by a combination of luck and skill occur in horse-races.

The result of a horse-race depends upon a number of factors, some of which are known ; thus the past does furnish an indication of what may be expected in the future. Unlike roulette, the conditions are never exactly the same on two occasions. The issue depends on the weights carried, the quality and number of the competitors, the length and nature of the course, the weather, the season, the health and training of horses and jockeys. These incessantly changing conditions prevent the result of one race from being a sure guide as to the result of another race. It has, however, been found, that the horse most generally fancied, the 'favourite', wins oftener than any other horse. Sometimes there is a false favourite, that is a horse supported by more money than brains, either a popular idol or the

pet of a wealthy and reckless stable; but, as a rule, the favourite carries the best opinion. Records show that the favourite wins, on the average, two races in five, the 'field' providing a winner in three races in five. The odds are, therefore, not more than 6 to 4 against the favourite—a clear evidence that deductions of some value may be derived from past results. If the bookmaker were to lay 6 to 4 against every favourite, and had no bets on the other horses, he would make no profit. As he is a money-maker and not a sight-seer, he is obliged to lay less than the correct odds about every horse in the race. The less a horse's chance, the falser are the bookmaker's odds. He makes his prices suit the public. A backer who thinks an outsider worthy of support is generally so confident that he will readily accept 20 to 1, when 100 to 1 would have been a truer statement of the horse's chance.

# FORTUNA

The backer knows that the favourite is the most likely horse to win, but that it does not pay to back favourites, because the odds offered by the bookmaker are weighted with the middleman's profit. He may decide to rely upon his own judgment. But the combined knowledge of the racing world is already proclaimed by the odds offered against the candidates.

Many backers rely upon the advertising tipster for advice. The tipster will, for a small fee, tell you what horse is going to win. He does not always assert that his horse is certain to win, but he guarantees the secrecy and the value of his information. Those who buy the opinion are singularly credulous. If the tipster thought it worth anything he would follow it himself.

Some backers try a system, a progression, the stake being increased after a loss. The vital condition which governs roulette does not here

apply, for the result of a horse-race may be practically certain, which is never the case with a throw at roulette. In this situation, the book-maker may demand that the backer should give the odds, or he may decline to bet altogether, but the essential point is that, owing to the knowledge acquired from previous races, a stage may be reached when the favourite is sure to win. Public judgment with regard to the merits of the competitors cannot always be wrong. The longest series of losses recorded in British racing is thirty. We may say, then, that a system of progression which would leave a profit after thirty losses would be infallible.

In practice, no such progression is feasible, for it would entail, in case of a sequence of losses, a huge stake which no backer could offer and no bookmaker would accept. The odds are more than a thousand million to one against a series of thirty; thus,

after 29 losses, and odds of 6 to 4 offered against the favourite, the backer would have to obtain a wager in millions of pounds. Even a sequence of twelve losing favourites, an event which is far from rare, would raise the wager to four thousand times the original unit. If after a sequence of losses the next stake is too large to be either offered or accepted, the system of increased stakes breaks down just when it was being called upon. There is a maximum on the racecourse as at Monte Carlo.

Apart from the difficulty of guessing the winner, it is not always easy for the occasional racegoer to find a reputable bookmaker prepared to accept a proposed bet, at the price that is being quoted. This objection may be overcome by the use of the *pari mutuel*, or totalizator.

The officials in charge of the totalizator sell tickets, as at a railway-station. The purchaser buys one or more tickets

—as many as he desires—upon each of which is stamped the name of the horse whose chance he favours. On a scoring-board, not unlike that used at an important cricket-match, the purchase of each ticket is recorded. Thus the opinion of the public about each of the horses is displayed. The purchaser of a ticket may find that his opinion is shared by many people or that he stands almost alone.

The sale of tickets is stopped as soon as the race has begun. The officials employ a calculating machine, which enables them with celerity to deduct from the total amount received for tickets sold, a percentage for expenses, and to divide the remainder by the number issued in favour of the ultimate winner. The result obtained is the sum due to each backer of the winner.

For example, if, after the percentage for expenses has been deducted, the sum remaining is £100, and 50 tickets upon the winner have been sold, the sum due to each purchaser is £2;

if only one ticket was sold, the lucky purchaser will receive £100 for his £1 ticket. Some very high dividends have been obtained when an extreme outsider has won. As much as £2000 has been paid for a £1 ticket.

We will take the odds actually offered by the bookmakers in an important race, and compare them with what we may suppose that the totalizator would have given, on the assumption that the bookmaker's odds about the favourite may be accepted as a basis, but that the odds become increasingly unfair as you get further from the favourite to the outsiders.

BOOKMAKER'S ODDS

|  | Odds offered | Actual bet | Total stakes |
|---|---|---|---|
| Favourite | 7 to 4 | 70 to 40 | 110 |
| Second | 5 ,, 2 | 79 ,,ᶦ31 | 110 |
| Third | 4 ,, 1 | 88 ,, 22 | 110 |
| Fourth | 11 ,, 1 | 99 ,, 9 | 108 |
| Fifth | 20 ,, 1 | 100 ,, 5 | 105 |
| Sixth | 25 ,, 1 | 100 ,, 4 | 104 |
| Seventh | 50 ,, 1 | 100 ,, 2 | 102 |
| Eighth | 50 ,, 1 | 100 ,, 2 | 102 |
| Ninth | 66 ,, 1 | 100 ,, 1½ | 101½ |
| Tenth | 66 ,, 1 | 100 ,, 1½ | 101½ |
|  |  |  | 118 |

All the totals in the fourth column should have been 110, but to obtain that figure on every horse would have meant betting in decimals in some cases. The calculation is sufficiently correct for our purpose.

With one bet on each horse, to the amount desired, in this case 110, the bookmaker's profit would be 78 — 70 = 8 if the favourite wins, and the same profit would be given whichever horse wins if the calculation were correct to fractions. In practice, however, the bets on the favourite are so numerous that if that horse wins the bookmaker loses on balance.

The totalizator dividends we may expect to be as follows :

| | Fair odds | Proper bet | | Totalizator Dividend |
|---|---|---|---|---|
| Favourite | 7 to 4 | 70 to 40 | 110 | 2.5 |
| Second | 5 ,, 2 | 79 ,, 31 | 110 | 3.2 |
| Third | 9 ,, 2 | 89 ,, 21 | 110 | 4.8 |
| Fourth | 13 ,, 1 | 102 ,, 8 | 110 | 12.2 |
| Fifth | 26 ,, 1 | 106 ,, 4 | 110 | 24.7 |
| Sixth | 36 ,, 1 | 107 ,, 3 | 110 | 33 |
| Seventh | 100 ,, 1 | 109 ,, 1 | 110 | 99 |
| Eighth | 100 ,, 1 | 109 ,, 1 | 110 | 99 |
| Ninth | 200 ,, 1 | 109½ ,, ½ | 110 | 198 |
| Tenth | 200 ,, 1 | 109½ ,, ½ | 110 | 198 |
| | | 110 | | |

# FORTUNA

The totalizator dividend is obtained by deducting 10 per cent. from the total stakes, 110, and dividing the 99 units left between the investors on the various horses. There were 40 on the favourite, 31 on the second, and so on.

From the totalizator dividend, has to be deducted the backer's stake of one, which is included in the dividend. Thus the profit on the favourite is 1.5 ; the bet was therefore 6 to 4, whereas the bookmaker gave 7 to 4. On the outsiders the totalizator gave 197 and the bookmaker only 66. This is a characteristic example of the difference between the two systems. The totalizator gives a rate on the favourite, slightly less than that of the bookmaker, and a rate on the outsiders much greater than that of the bookmaker.

The advantages of the totalizator are great. The odds, minus the percentage, are fair, and the backer

of a horse knows that his ignorance of the market will not prevent him from obtaining the best price, whatever horse he may select. There is no temptation to bet on credit; nor is it feasible to risk a large sum. The bets being in small amounts, and cash down, there is no fear of being unable, on the settling day, to pay large sums due to a bookmaker. Where the bookmaker does a cash business, the occasional racegoer may not be quite at ease in his mind as to the ultimate payment if he wins. He knows, at least, that he will not be welshed by the racecourse officials in charge of the totalizator.

The totalizator is impersonal, like roulette. The average man has no desire to engage in personal combat, on his holiday; to feel that the book-maker is an antagonist who rejoices when his client loses, and pays un-willingly when he wins. It is pleasanter to have direct dealings with Fortuna.

herself. The sordid duel for money, between two human beings, becomes transfigured into an appeal to a Divinity.

The amenities of racing are much improved by the great reduction which the totalizator makes, in the number of bookmakers present at a meeting. A few bookmakers suffice for the clients who desire to make large wagers, and to do so on credit. No longer do bookmakers cumber the fairway in their multitudes, nor shake the sky with their clamour. It becomes possible to move about in comfort. This is a consideration of importance for ladies.

Where the totalizator is in operation, the interest and the influence of the general public is enhanced. The percentage deducted from the stakes enables the organizers of the entertainment to provide better accommodation, and to give larger prizes. The percentage is returned, in benefits, to the

public which provides it. This has been the experience in every country in the world.

It is said that the betting public would prefer to trade with a reputable bookmaker, at a price defined at the time, rather than remain uncertain as to the sum they may win. That may be true of a part of the betting public, if by that term is meant the habitual racegoers, who spend their lives at race-meetings. But many even of that section of visitors would, if given the opportunity, desert the bookmaker for the totalizator, while the general public would be attracted instead of being repelled. A new, and temperate, betting public is created. Horse-racing becomes truly national instead of being, as at present, professional and semi-professional.

Most of the speculation that takes place on the Stock Exchange is conducted by professionals. They bet with each other with regard to the

future value of a stock. Without buying or selling the stock, they bet on the difference between its present and its future price. At the end of every fortnight they make up their accounts, but the actual payment may be postponed, the wager continuing on the same terms for another fortnight. To tide over that period, a loan called a 'contango' is arranged. Contango is the zero of the Stock Exchange. As a rule, the stock which the speculators have selected does not change as rapidly as had been anticipated, and the contango, like zero, exacts a percentage which rises steadily with every repetition of the fortnightly wager.

If an amateur desires to take a hand in the affray, he has to pay a commission to the middleman for obtaining the opportunity of exploiting his belief that he has unusual powers of divination. For the price of a stock is the value put upon it by the experts, and

the amateur who speculates is disputing their verdict.

Those, for instance, who bought marks or francs when they were falling in value, imagined that they alone were capable judges of the financial conditions of Germany or France. They did not reflect that the price at which they bought was the price fixed by the world's experts, whose life-business it had been to study German and French finance and the German and French characters. The falling mark or franc showed that those who knew most were apprehensive, and were revising their judgments. But the amateur " believed in Germany ", or said that " France is a rich nation ", and supposed that the world's financiers had not given due attention to these considerations.

A cool head is worthless at roulette; it is desirable when betting on a horse-

race ; it is essential for speculation in stocks.

Roulette, though its awards are capricious and cannot be foreseen, is the safest gamble of the three, because the contest is always fair. That is not invariably the case in a horse-race ; there are some dishonest people connected with the sport. The speculator in stocks has to contend with misrepresentation on a large scale.

For this reason, we may suppose, in the absence of statistics, that amateur speculation in stocks is the most expensive form of wagering. We may, then, assess the various forms of gambling, in order of demerit, as follows :

1. Stock Exchange speculation

2. An outsider in a horse-race

3. The favourite in a horse-race

4. Roulette : the numbers ; loss, 2.7 per cent.

# CHANCE AND DESIGN

5. Roulette: the even chances; loss, 1.35 per cent.
6. Trente-et-quarante; loss, 1.28 per cent.

The study of roulette, with its contest between the individual and the aggregate, brings before us one of the great problems of the day. Will mass-production destroy personality? Are we destined to become as alike as the beads of a necklace? Are originality, and character, to disappear, crushed down by the pitiless commands of States, or of large Corporations?

Without attempting to prophesy, it is pertinent to observe that we have at Monte Carlo an example of the manner in which the egotistical fancies which every human being carries about with him, may be exploited by a Society. Thus Chance is governed by Design.